CLAIMS

1. A protective disk for protecting a semiconductor wafer during processing, comprising:

an adhesive layer configured to adhere to the semiconductor wafer; and

a support layer coupled to the adhesive layer configured to support the semiconductor wafer during processing.

2. The protective disk of claim 1, wherein the adhesive layer comprises a high molecular weight polymer.

3. The protective disk of claim 2, wherein the polymer is soluble in one of the group consisting of:

a mildly alkaline solution; and

a mildly acidic solution.

4. The protective disk of claim 1, wherein the support layer comprises a polymer and at least one of the group consisting of:

a filler; and

a reinforcement.

5. The protective disk of claim 4, wherein the filler comprises one or more of the group consisting of:

alkali oxides;

alkali salts;

transition metal oxides;

transition metal salts;

alkaline earth oxides; and

alkaline earth salts.

6. The protective disk of claim 5, wherein the percentage by weight of filler in the support

layer ranges from 1% to 95%.

7. The protective disk of claim 2, wherein the support layer comprises the polymer and at least one of the group consisting of:

    a filler; and

    a reinforcement.

8. The protective disk of claim 4, wherein the reinforcement is at least one of the group consisting of:

    a fiber;

    a matting;

    a platelet; and

    a whisker;

    and, wherein the reinforcement comprises at least one of the group of materials consisting of:

    a glass;

    a ceramic;

    a carbon; and

    a polymer.

9. The protective disk of claim 1, wherein the protective disk is substantially the same diameter as the semiconductor wafer.

10. The protective disk of claim 1, wherein thickness of the protective disk is approximately 600μm.

11. The protective disk of claim 1, wherein the adhesive layer has sufficient thickness to conform to topographical features of the semiconductor wafer.

12. The protective disk of claim 1, wherein the protective disk provides support to edge bevel

of the semiconductor wafer.

13. The protective disk of claim 1, further comprising:

an intermediate layer located between the adhesive layer and the support layer configured to provide additional properties to the protective disk.

14. The protective disk of claim 13, wherein the intermediate layer is configured to provide at least one of the group consisting of:

ability to conform to topographical features of the semiconductor wafer; and

enhanced strength of the protective disk.

15. The protective disk of claim 1, wherein bulk modulus of the protective disk is sufficient to provide strength and stiffness to wafer/disk composite and to provide sufficient suppleness and toughness to prevent brittle failure of the wafer/disk composite.

16. The protective disk of claim 1, wherein the protective disk is sufficiently waterproof to endure a back-grinding process.

17. The protective disk of claim 1, wherein the protective disk withstands chemistries used for post-grind stress relief.

18. The protective disk of claim 1, wherein the coefficient of thermal expansion (CTE) of the protective disk is tailored to correspond to the CTE of the semiconductor wafer.

19. The protective disk of claim 1, wherein the protective disk is removable by contact with one of the group consisting of:

a mildly alkaline solution; and

a mildly acidic solution.

20. The protective disk of claim 19, wherein the mildly alkaline solution is selected from the

group consisting of:

hydroxides of ammonium; and

hydroxides of potassium.

21. A method in semiconductor wafer processing, comprising:

affixing a protective disk to device side of semiconductor wafer;

thinning the semiconductor wafer with the protective disk affixed;

mounting the semiconductor wafer onto a dicing frame with the protective disk affixed; and

removing the protective disk by applying an aqueous cleaning solution.

22. The method of claim 21, further comprising:

conforming edge of the protective disk to edge profile of the semiconductor wafer.

23. The method of claim 21, wherein the affixing step further comprises displacing trapped air from between the protective disk and the semiconductor wafer.

24. The method of claim 23, wherein the affixing step is augmented by at least one of the group consisting of:

application of heat;

application of pressure; and

application of vacuum.

25. The method of claim 21, wherein the removing step further comprises:

applying energy to remove the protective disk.

26. The method of claim 25, wherein the energy applied is in form of at least one of the group consisting of:

mechanical agitation; and

sound waves.

27. The method of claim 21, further comprising:

processing waste materials that are produced by the removing step.

28. The method of claim 21, further comprising:

relieving stress from the semiconductor wafer.

29. The method of claim 21, wherein the protective disk is affixed in solid form.

30. The method of claim 21, wherein the protective disk is affixed in liquid form.

31. The method of claim 30, wherein the affixing step comprises at least one of the group consisting of:

screen printing;

doctor blading;

waterfall; and

spin coating.

32. The method of claim 21, wherein the affixing step further comprises using a tape roll system.

33. The method of claim 21, wherein the aqueous cleaning solution is selected from the group consisting of:

an alkaline solution; and

an acidic solution.

34. The method of claim 21, wherein the thinning step thins the semiconductor wafer to a thickness less than 150μm.

35. A method in semiconductor wafer processing, comprising:

affixing a protective disk to device side of semiconductor wafer;

thinning the semiconductor wafer with the protective disk affixed;

mounting the semiconductor wafer onto a dicing frame with the protective disk affixed;

relieving stress from the semiconductor wafer; and

removing the protective disk by applying an aqueous cleaning solution.